

REMARKS

A typographical error noted at page 5 of the specification has been corrected.

In the Office Action dated October 3, 2005, claims 1-6, 8 and 11 were rejected under 35 U.S.C. §102(b) as being anticipated by United States Patent No. 5,877,861. Claims 7 and 9 were rejected under 35 U.S.C. §103(a) as being unpatentable over the '861 patent. Claim 10 was rejected under 35 U.S.C. §103(a) as being unpatentable over the '861 patent, further in view of United States Patent No. 6,235,038. Claims 12-16 were rejected under 35 U.S.C. §103(a) as being unpatentable over the '861 patent, further in view of United States Patent No. 6,052,611.

These rejections are respectfully traversed for the following reasons.

As explained in the first paragraph in the BACKGROUND OF THE INVENTION section of the '861 patent, the method and apparatus disclosed in that reference are directed to semiconductor manufacturing, wherein multiple integrated circuit patterns are printed on successive levels of exposure tools known as steppers. As stated in the '861 reference, these steppers typically pattern different layers by applying a step-and-repeat lithography exposure, or a step-and-scan lithography exposure, wherein the full area of a wafer is patterned by the sequential exposure of stepper fields containing one or more integrated circuits (chips).

As also described in this section of the '861 reference, two types of overlay errors must be compensated, these being designated as between-field errors that occur within a single level (A to A or B to B), and overlay errors that occur between two overlying levels, referred to as a level-to-level error (A to B).

For generating the pattern in one plane, in the '861 reference a single structure is repeated multiple times in succession, one structure next to another, in one plane for exposing the underlying photoresist. The positioning error of the structures relative to each other in this plane are determined by the arrangement of markings A to A or B to B, as described in Figures 3a and 3b of the '861 reference, and the description beginning at column 1, lines 39-55 (which also pertains to Figure 5 of the '861 reference). By contrast, *different* structures are formed in successive planes or layers in the '861 reference, as indicated in Figure 6 and the accompanying description. For this purpose, not only positioning errors within the plane, but also errors from plane-to-plane (A to B errors) are also determined by means of markings. The A to A and B to B errors in the respective individual planes must be corrected when the patterns for those individual planes are generated. Only *after* those patterns have been correctly generated can level-to-level errors be identified and corrected. Therefore, the correction of the A to A and B to B errors must occur *prior* to correction of the A to B errors, (i.e., the error corrections, and thus the occurrence of the markings) cannot take place simultaneously.

This is in contrast to the method of claim 1, wherein a single image is obtained that simultaneously includes at least three markings. Claim 1 has been editorially amended to explicitly state that a single image is generated in which at least three simultaneously-present markings are included, although Applicants submit this was clear from the original claim language. Support for this added language is present in the specification as originally filed in the paragraph beginning at page 9, line 6, wherein it is clearly stated that the calibration object 2 has all three markings A, B, C secured thereto. Obviously from this description, and from the

schematic representation shown in Figure 1, all three markings A, B, and C are simultaneously present on the carrier member 4.

Therefore, in the method of claim 1 a single structure is imaged only once, and an imaging error is determined from this one-time imaging. A localized imaging error of the imaging system is then determined using this image. By contrast, the method and apparatus disclosed in the '861 reference require multiple imaging of the same object, or multiple imaging of different objects, as is typical in the case of stepper technology.

The problem of determining local imaging errors (thus errors *within* a "field" in the terminology of the '861 reference) is not discussed at all in the '861 reference. The '861 reference therefore provides no disclosure that represents a solution to this problem, and no suggestion as to how this problem can be solved.

The '861 reference, therefore, does not disclose all of the method steps of claim 1 as arranged and operating in that claim, and thus does not anticipate claim 1, nor any of the claims depending therefrom.

As to independent claim 11, Applicants believe the original language of that claim is sufficient to distinguish that claim over the disclosure of the '861 reference. In the '861 reference, for the reasons discussed above, there is no holder on which three markings are secured that can be introduced into a region of an imaging volume. The '861 reference teaches only the imaging of markings, but does not provide information regarding the physical markings themselves. Multiple markings that are naturally contained within a mask are associated with a single "field," but no holder according to claim 11 is provided for this purpose, and clearly no holder is

disclosed in the '861 reference to which two markings are secured in a first area and a third marking is secured in a second area of an image.

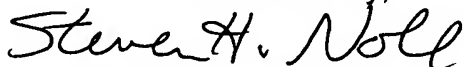
Claim 11, therefore, is not anticipated by the '861 reference.

As to the rejection of claims 7 and 9 as being obvious under 35 U.S.C. §103(a) based on the teachings of the '861 reference, both of those claims embody the subject matter of independent claim 1 therein, and for the reasons discussed above, the '861 reference provides no suggestion with regard to the method of independent claim 1. Claims 7 and 9, therefore, would not have been obvious to a person of ordinary skill in the field of imaging error correction, based on the teachings of the '861 reference.

For similar reasons, even if the '861 reference were modified in accordance with the teachings of the '038 reference or the teachings of the '611 reference, the subject matter of claim 10 still would not result, nor would the subject matter of claims 12-16. None of those claims, therefore, would have been obvious to a person of ordinary skill in the field of imaging technology based on the teachings of the '861 reference in view of the teachings of either of the secondary references.

All claims of the application are therefore submitted to be in condition for allowance, and early reconsideration of the application is respectfully requested.

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